

The intent of this Part is to protect, conserve, preserve and replace trees in order to enhance community character, provide wildlife habitat, maintain air and water quality, decrease stormwater runoff, prevent soil erosion, provide noise buffers, and enhance property values. This Part is also intended to provide several alternative means to the Planning Commission to further the goals and objectives of the Comprehensive Plan by providing for flexible tree canopy requirements subject, however, to specified standards and findings. Tree canopy standards shall be met on site to the maximum extent feasible and tree preservation is the preferred means of accomplishing canopy objectives.

The following terms relating to Tree Canopy are included in the Definitions (Chapter 1 Part 2): Caliper, Dripline, Tree Canopy, Tree, Type A, Tree, Type B, Tree, Type C

10.1.1 Relationship to the Comprehensive Plan

The tree canopy regulations prescribed by this Part are intended to implement the following Cornerstone 2020 Comprehensive Plan Goals and Plan Elements.

Goals	Plan Elements
Livability Strategy Goals F2; F3; F4; G4	Guidelines 3, 10, 13

10.1.2 Applicability and Basis of Calculation

- A. The requirements of this Part shall apply to all new residential subdivisions creating more than five (5) buildable lots and to all new multi-family and nonresidential development. New single-family residential construction shall provide tree(s) in accordance with the residential design standards found within chapter 5.
- B. Expansion or reconstruction of an existing nonresidential building or development shall be subject to the requirements of this Part as follows:
 1. Any development site on which there is an increase in impervious surface area by **more than fifty (50) percent** or where a structure has been demolished and a new structure has been built in its place shall fully comply with the tree canopy requirements set forth in this Part.
 2. Any development site on which there is an increase in impervious surface area by **more than twenty (20) percent and less than fifty (50) percent** shall provide one-half (1/2) the tree canopy required by this Part.
 3. Any development site on which there is an increase in impervious surface area by **twenty (20) percent or less** shall be required to provide tree canopy equivalent to the increased impervious surface area.
 4. An increase of impervious surface area of 200 square feet or less is exempt from this requirement.
- C. The requirements of this Part shall apply to the entire area shown on a development plan and the required canopy may be equally distributed throughout that area or be concentrated in certain parts or portions of that area.

NOTE: This provision (10.1.2, C) allows residential subdivisions and multi-lot commercial developments to group trees in clusters throughout the development rather than meeting the canopy requirements on a lot-by-lot basis.

10.1.3 Methods of Compliance

The tree canopy requirements of this Part may be satisfied at the applicant's discretion by any combination of the following means.

- A. Preservation of existing trees or tree stands on the development site.
- B. Planting new trees on the development site or as street trees on adjacent rights-of-way.
- C. Pay fee in lieu, as determined by Planning and Design Services' designee, to a designated city tree account per 1 ¾ caliper inch tree required to meet the site canopy requirement. These funds will be administered by the City Arborist for the planting and maintenance of trees pursuant to the city's Tree Canopy Master Plan or at sites determined by the Tree Advisory Commission.

Note: The Louisville Metro Tree Advisory Commission (LMTAC) Policy Committee recommends the fee amount be determined through a bid process occurring at a regular interval of years as determined by Planning and Design. The Policy Committee's intent is to provide a clear connection between these funds and trees being planted and maintained. The Policy Committee also recommends that the LMTAC develop a guidance policy for determining recommended planting sites until a Tree Canopy Master Plan is developed.

10.1.4 Tree Canopy Standards

- A. The tree canopy on a development site shall meet the applicable standards according to the site's form district, proposed land use and the amount of tree preservation, as set forth in Tables 10.1.1 and 10.1.2, below. (Percentages refer to the relation of tree canopy to gross site area in square feet.)

Table 10.1.1 Tree Canopy Categories by Form District

Land Use	Form District			
	Downtown	Traditional Neighborhood, <u>Traditional Marketplace Corridor, Traditional Workplace, Town Center</u>	Regional Center, , Suburban Marketplace Corridor, Neighborhood, Suburban Workplace, Campus	Village
Single-Family Residential	Class A	Class B	Class C*	Class D
Multi-Family and Office	Class A	Class B	Class C	Class D
Institutional	Class A	Class B	Class C	Class D
Commercial	Class A	Class B	Class C	Class C
Industrial	Class A	Class B	Class C	Class C

* Docket No. 9-26-03; see website for adoption status outside Louisville Metro

Table 10.1.2 Minimum Tree Canopy Coverage

Class Canopy Requirement per Table 10.1.1	Preserved Tree Canopy Coverage Area	New Tree Canopy Coverage Area	Total Tree Canopy Coverage Area Required
Class A	<u>7%</u>	0%	<u>7%</u>
	<u>6%</u>	<u>4%</u>	<u>10%</u>
	<u>5%</u>	<u>6%</u>	<u>11%</u>
	<u>4%</u>	<u>8%</u>	<u>12%</u>
	<u>3%</u>	<u>10%</u>	<u>13%</u>
	0%	<u>15%</u>	<u>15%</u>
Class B	<u>12%</u>	0%	<u>12%</u>
	<u>10%</u>	<u>5%</u>	<u>15%</u>
	<u>8%</u>	<u>8%</u>	<u>16%</u>
	<u>6%</u>	<u>11%</u>	<u>17%</u>
	<u>4%</u>	<u>14%</u>	<u>18%</u>
	0%	<u>25%</u>	<u>25%</u>
Class C	<u>19%</u>	0%	<u>19%</u>
	<u>16%</u>	<u>9%</u>	<u>25%</u>
	<u>13%</u>	<u>14%</u>	<u>27%</u>
	<u>10%</u>	<u>19%</u>	<u>29%</u>
	<u>7%</u>	<u>24%</u>	<u>31%</u>
	0%	<u>35%</u>	<u>35%</u>
Class D	<u>24%</u>	0%	<u>24%</u>
	<u>19%</u>	<u>10%</u>	<u>29%</u>
	<u>14%</u>	<u>16%</u>	<u>30%</u>
	<u>9%</u>	<u>22%</u>	<u>31%</u>
	0%	<u>35%</u>	<u>35%</u>

Note: The LMTAC Policy Committee agreed to a single section for Class C as compromise with developers' recommendation in the interest of streamlining, but chose the middle section of the three original sections (not the minimum) and still recommends the increased canopy requirements that are included in the other sections.

- B.** Preservation of existing tree canopy in excess of the cover specified in Tables 10.1.1 and 10.1.2 and retention of trees in sensitive natural areas are encouraged. However, removal of existing tree canopy that covers a greater percentage of the site than stipulated in the minimum standards set forth above is permissible unless restricted by an approved development or subdivision plan or by other applicable provisions of this Land Development Code.

Note: The LMTAC Policy Committee disagrees with removal as recommended by developers. It may state the obvious, but it underscores the intent to preserve canopy to the greatest extent possible. This section could also be expanded if incentives to greater preservation are identified.

- C.** Any tree preserved or planted to meet the minimum requirements of this Part shall be maintained in healthy condition and shall be replaced if it becomes diseased or dies, as required by 10.4.13.
- D.** The Planning Director may require that any trees and/or tree stands preserved to meet the requirements of this Part be inspected and found to be healthy and free of disease by a Certified Arborist or registered landscape architect if, upon inspection of the site, the Planning Director or his/her designee sees evidence that indicates that some or all of said trees may be unhealthy and may not be appropriate for preservation.

Note: The LMTAC Policy Committee disagrees that this section is unnecessary in light of the language in the previous section. Though this could add burden and expense, it is a discretionary authority of the Planning Director, and though it is seldom used, it underscores the importance of preserving healthy trees and serves as a deterrent to inappropriate assignment of tree canopy credit to unhealthy trees.

- E.** When trees are planted off-site or on private property to meet the requirements of this Part, the applicant shall provide the Planning Director with documentation that sufficient measures have been taken to ensure the preservation and, when necessary, the replacement of said trees. Examples of such measures would include, but not be limited to, including preservation and replacement provisions in a subdivision's deed of restrictions or within a development's binding elements or by placing all of the required trees within a conservation easement or a Woodland Protection Area (WPA).
- F.** What trees are not protected?
All known invasives are not protected and will not be considered toward meeting the tree canopy requirements. However, tree canopy credit will be received (see Table 10.1.3 and 10.1.4 for credit square footage) for the removal of the invasive if it is replaced by a 1 ¾" caliper Type A or Type B tree.

NOTE: *Invasive Species means "an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health." (Executive Order 13112 signed by President William Clinton on February 3, 1999).*

10.1.5 Calculation

- A.** Any development site greater than two acres in size shall be permitted to determine the area of existing tree canopy coverage to be preserved by ground checking, aerial analysis, or any other method determined to be accurate by DPDS staff. If ground checking is utilized, credit for existing trees intended to be retained may be calculated in either of two ways:
1. measurement of the trunk of each individual tree (i.e. a tree not grouped with other trees or a part of a tree stand) to determine its caliper and the credit given for that tree shall be in accordance with Table 10.1.3, below; or
 2. the dripline may be plotted on the site plan and tree canopy credit given for the square footage of the site within the dripline.
- B.** For any development site two acres or less in size the area of tree canopy coverage for any group of trees to be retained in order to meet the tree canopy requirements of this Part shall be determined by ground checking. Credit for existing trees intended to

be retained may be calculated in either of two ways:

1. measurement of the trunk to determine its caliper and the credit given for that tree shall be in accordance with Table 10.1.3, below; or
 2. the dripline may be plotted on the site plan and tree canopy credit given for the [square footage](#) of the site within the dripline.
- C. New trees planted to meet the requirements of this Part shall be given credit in accordance with Table 10.1.3, below. Such trees must meet the standards of Chapter 10 Part 4 at the time of planting.
- D. Street trees planted in accordance with Section 10.2.8 shall qualify for a 25% bonus in the amount of credit listed in Table 10.1.3. This credit shall apply to street trees that are mandated as well as those planted on a voluntary basis.
- NOTE:** *Street tree bonus: for example, a development that provides three Type A trees two inches in caliper shall receive credit for 2,250 sq ft of tree canopy.*
- E. All approved WPAs shall qualify for a 10% bonus in the amount of credit listed in Table 10.1.3.
- F. In calculating the required number of trees, fractions less than .5 shall be dropped and greater than or equal to .5 shall be rounded up.

Table 10.1.3 Deciduous Tree Canopy Credit

Caliper	Tree Type**	Amount of Credit (per tree)
10 inches or greater	Type A	1,200 sq. ft. (100% mature canopy size)
	Type B	720 sq. ft. (100% mature canopy size)
	Type C	177 sq. ft. (100% mature canopy size)
Greater than or equal to 3 inches and less than 10 inches	Type A	960 sq. ft. (80% mature canopy size)
	Type B	576 sq. ft. (80% mature canopy size)
	Type C	142 sq. ft. (80% mature canopy size)
Greater than or equal to 1 3/4 inches and less than 3 inches	Type A	720 sq. ft. (60% mature canopy size)
	Type B	432 sq. ft. (60% mature canopy size)
	Type C	106 sq. ft. (60% mature canopy size)
Greater than or equal to 1 inch and less than 1 3/4 inches*	Type A	600 sq. ft. (50% mature canopy size)
	Type B	360 sq. ft. (50% mature canopy size)
	Type C	89 sq. ft. (50% mature canopy size)

* See Chapter 10, Part 4 for criteria to plant trees less than 1 3/4 inch caliper.

** Trees are categorized as A, B and C—Large, Medium and Small; refer to Appendix 10A for species that fall within each category.

NOTE: *Table 10.1.3 gives credit for 50% of the mature canopy size when a 1 3/4" – 3" caliper tree is planted.*

NOTE: *For particularly mature trees, ground checking may yield larger credits than those based on this table.*

Table 10.1.4 Evergreen Tree Canopy Credit

Height	Tree Type*	Amount of Credit (per tree)
15 feet and greater	Type A	1,200 sq. ft. (100% mature canopy size)
	Type B	720 sq. ft. (100 % mature canopy size)
	Type C	177 sq. ft. (100% mature canopy size)
Greater than or equal to 9 feet and less than 15 feet	Type A	960 sq. ft. (80% mature canopy size)
	Type B	576 sq. ft. (80% mature canopy size)
	Type C	142 sq. ft. (80% mature canopy size)
Greater than or equal to 6 feet and less than 9 feet	Type A	720 sq. ft. (60% mature canopy size)
	Type B	432 sq. ft. (60% mature canopy size)
	Type C	106 sq. ft. (60% mature canopy size)

* Trees are categorized as A, B and C—Large, Medium and Small; refer to Appendix 10A for species that fall within each category.

NOTE: For particularly mature trees, ground checking may yield larger credits than those based on this table.

Note: The LMTAC Policy Committee revised their original recommendation to remove this table. Discussion brought to light the fact that removing this section could incentivize the loss of existing evergreen canopy. Instead, the Policy Committee will look closely at the classification of evergreen trees in Appendix 10A to ensure that the canopy credit given is reasonable for each evergreen species.

10.1.6 Tree Protection Plan Requirement

NOTE: Refer to 10.4.8 for requirements relating to tree protection during construction.

- A. All applicants for development proposals which seek credit for existing tree canopy to attain the minimum canopy coverage specified in this Part shall submit a Tree Canopy Protection plan. All tree preservation, tree canopy protection and woodland protection areas shall be in accordance with the Tree Preservation Policies of Louisville Metro Planning and Design Services.

Note: The LMTAC Policy Committee agrees that this information is used to determine replanting needs in the case that a TCCA is removed without an approved plan revision and agrees with the developers' recommendation to remove these more detailed inventory requirements, using instead the inventory taken in 10.1.5, if provisions are added to Chapter 10 to assess a penalty for improper TCCA removal. The Policy Committee agrees to the penalty being a 25% increase in canopy requirement as recommended by the developers.

The species of trees planted in response to enforcement of this provision to meet the required canopy coverage plus a 25% increase would be determined by:

- *First, an inventory of species on surrounding sites. If those species are not on the prohibited list, then they would guide the selection of the trees being planted.*
- *Second, if surrounding sites do not have sufficient tree populations to provide for the diversity requirement of Chapter 10 Part 4, or if the trees present on surrounding sites are on the Prohibited Plant List in Appendix 10B, then species must be chosen from the Preferred Plant List in Appendix 10A.*

The planting plan developed to comply with the requirements of this section and approved by the Planning and Design staff landscape architect would be based on the opinion of an American Society of Consulting Arborists (ASCA) licensed consulting arborist, retained by LMG and paid for by the applicant. The ASCA licensed consulting arborist would perform the nearby site inventory and chose the species to be planted to comply with this section.

B. Standards for Tree Canopy Credit Areas

1. Tree Canopy Credit Areas (TCCA) are those areas where tree preservation has been provided to meet the tree canopy requirements of this part.
2. The site shall be developed in accordance with the TCCA Plan. The location of the TCCA boundary delineates the limit of disturbance associated with the TCCA. The limit of disturbance shall indicate the location of the tree protection fencing.
3. No clearing, grading, construction or other land disturbing activity shall take place within the TCCA beyond pruning to improve the general health of the tree or to remove dead or declining trees that may pose a public health and safety

4. Location of Structures and Parking
 - a. no structure (exception: fences, walls, retaining walls) shall be closer than 15 feet to the Limit of Disturbance (Tree Protection Fence).
 - b. No vehicle use area (VUA) shall be closer than 10 feet to the Limit of Disturbance (Tree Protection Fence).
 - c. No retaining walls shall be closer than 10 feet to the Limit of Disturbance (Tree Protection Fence) except for retaining walls approved by PDS staff to be used in the preservation of existing trees.
5. During all construction activity (includes clearing, grading, building construction and VUA construction) a copy of the approved [TCCA](#) Plan shall be on-site.
6. For sites larger than two acres, tree preservation plans shall be [approved](#) by a KY [Licensed Landscape Architect](#) or a [Certified Arborist](#).
7. Establishment of the Critical Root Zone ([CRZ](#)) –

**CRITICAL ROOT ZONE AREA
&
DRIP LINE**

Outermost portion
of the dripline

Dripline of a
damaged tree

Critical Root Zone =
 $0.5 \times \text{Height of tree}$

showing Critical Root Zone and Drip Line measurement for a damaged or deformed

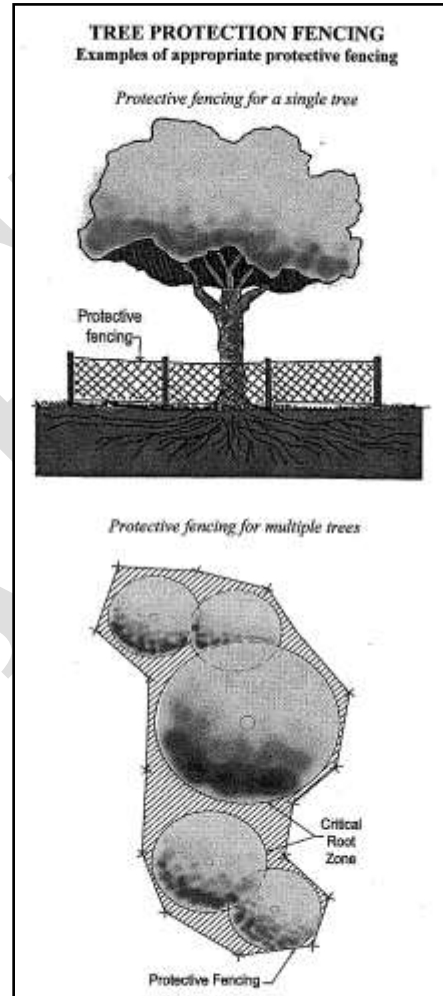


C. TCCA Exceptions – Sites which present unique development constraints will have opportunities to preserve existing trees as TCCA as determined by the Planning Director or designee. Such situations are described below.

1. Utilities - A proposed development which requires underground utilities shall avoid the installation of said utilities within the drip line and critical root zone of existing trees whenever possible. In the event that this is unavoidable, all trenching shall be done by directional boring taking extreme caution to avoid damage to the root structure. *(Note: LWC contractors are trained to use directional boring where applicable)*
2. Trunk Protection (Limited Application) - Tree trunk protection shall be provided in accordance with detail. Tree trunk protection shall consist of any 2 x 4-inch or 2 x 6-inch planking or plastic strapping
3. Tree Wells for Raised Grades - When existing grades are raised by more than 2 inches, the tree root system shall be protected by the installation of tree wells in accordance with detail (to be provided). Building materials (brick, stone, timber, etc.) similar to those utilized on site shall be used for the separator wall of the well and PVC conforming to ASTM D-2729, SDR-35 shall be used for the aeration systems in fill areas.
4. Cutting and Filling Around Trees - When the depth of an excavation or embankment exceeds 6 inches within the drip line or CRZ of any tree with a diameter greater than 4 inches, a tree well shall be constructed to protect the tree as indicated on the tree preservation plan.
5. Paving Around Trees - Where paving within the drip line of any tree greater than a 4 inch diameter is necessary, a permeable pavement and aeration system must be installed as indicated on the tree preservation plan, except for street construction. Permeable segmented pavers in conjunction with PVC pipe aeration system or concrete on gravel base with cored holes shall be used to protect existing tree root zones.
6. Other techniques as described by applicant and approved by the Planning Director or designee.

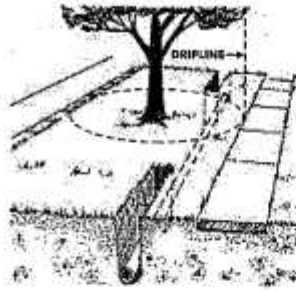
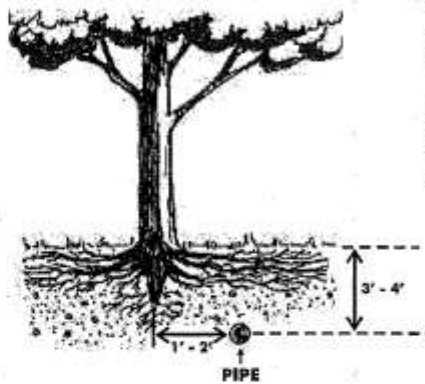
D. Percent change in TCCA - A threshold of change from development plan to construction plan will be considered as there are many unknowns at development plan stage (unforeseen site constraints, rock, utilities etc.). Percentage of change must be in keeping with the original intent of the TCCA shown on the plan. Percent of change from development plan to construction plan shall be no more than 20% of the original TCCA shown on the approved development plan. A change greater than 20% will require Planning Commission or designee approval.

Other techniques as described by applicant and approved by the Planning Director or designee.

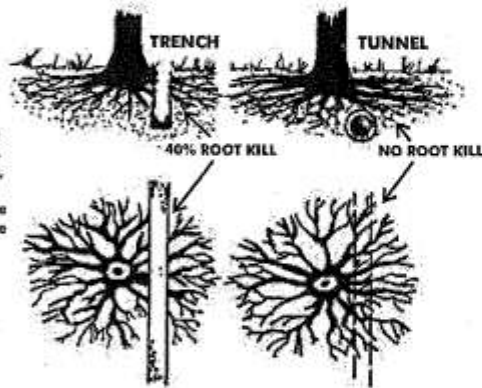


APPENDIX B. Tunneling (How to Save Existing Trees When Tunneling)

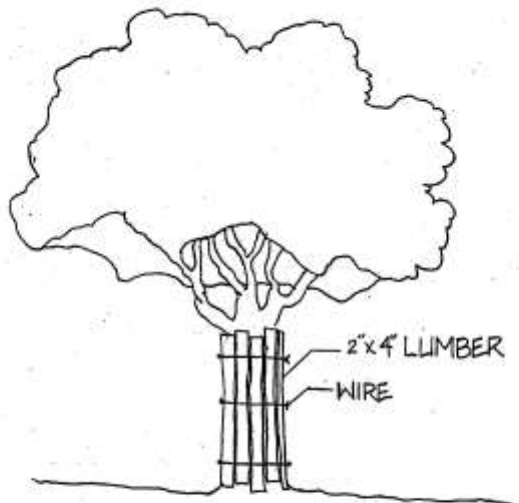
Use tunneling for underground utilities such as cable, electric, and natural gas instead of cutting an open trench. This method will help preserve existing trees or smaller tree save areas.



Why Tunneling Saves Trees
Trenching near a tree can kill as much as 40 to 50 percent of the tree's roots. This will almost certainly lead to stress, poor health, lack of firmness against wind, or outright death. A tunnel in the same place will do virtually no damage to the tree.



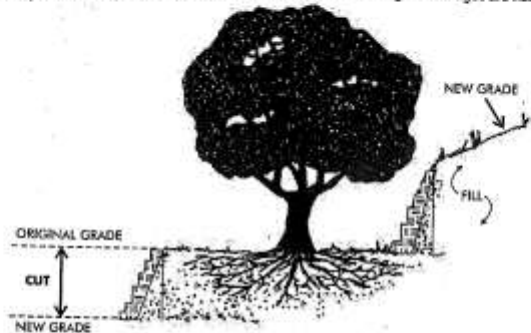
BARK PROTECTION



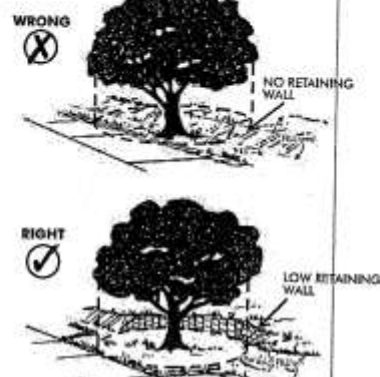
In situations where a protected tree remains in the immediate area of intended construction and the tree may be in danger of being damaged by construction equipment or other activity, the contractor or subcontractor shall protect the tree with 2"x4" lumber encircled with wire or other means that do not damage the tree. The intent is to protect the trunk of the tree against incidental contact by large construction equipment.

APPENDIX C: Grade Changes

How to preserve existing trees with the use of retaining walls when grade changes are necessary



Grade Change Examples - Methods of preventing root suffocation from fill dirt when changing grade



10.1.7 Landscape / Buffer Credit

Any existing trees on a site or street trees planted on an adjacent right-of-way that are used to meet the requirements of this Part shall be credited towards fulfillment of any landscaping, screening, or buffering provisions of this Chapter.

10.1.8 Waivers

The Planning Commission, [upon finding a compelling financial inability by an applicant to undertake any of the Methods for Compliance specified in 10.1.3](#), shall have the authority to grant [full or partial](#) waivers of the tree canopy requirements contained in this Part in accordance with Chapter 11 Part 8 of the Land Development Code.

Note: The LMTAC Policy Committee revised their original recommendation to remove this section in its entirety. Clarification of the fee-in-lieu option for compliance with the tree canopy requirements leaves financial hardship as the only reason why an applicant may be unable to meet the requirements of this part. The streamlined waiver provision above gives relief for those rare instances.